Specification Amendments

Page 12, line 16 through page 13, line 4:

Figures 3 and 4 represent the prior art, and are vertical and cross-sectional diagrams of one embodiment of nuclear medicine imaging system, such as PET scanner which show all the lines of response which are collinear with the source used for performing the timing alignment and the transmission scans when the orbiting source, 14, is in the position shown. In a one example of a PET scanner, the CTI ECAT HR+, there are 320 detectors, each with 64 crystals, sometimes called "blocks", disposed on the surface of a cylinder consisting of four rings. It is only when the source is on the line joining a pair of these crystals 32 that true coincident counts can be recorded. Since the source diameter in the prior art is less than the detector width, this occurs only twice in each revolution, in positions [[14]] 34 and 33, (or about 2/640 of the total time the measurement is being made). This small fraction of the available time during which the timing calibration information can be obtained, makes the timing calibration a very slow process.

Page 14, line 22 through page 15, line 7:

Figure 6 shows one embodiment of the present invention in which the timing alignment source 51 consists of a thin layer of a positron emitting isotope like germanium-68, which is plated on the inner surface of a cylinder of plastic scintillator 52, which has been cut into two pieces 62, 63. In this illustration, the two pieces are formed by cutting the cylinder along its axis perpendicular to a diameter of one of its circular ends. There could be other possible arrangements, such as cutting it along a diameter approximately half way along its length. The two pieces are then glued together with optical cement, and coupled to a fast photo-multiplier 64. The anode **[[63]]** of the photo-multiplier 64 produces a signal, whose amplitude is proportional to the positron energy, each time a positron is detected.

Page 16, line 20 through page 17, line 2:

Figure 8 shows time exposure photograph of oscilloscope tracings of the anode signals **[[64]]** arising from each of many positrons losing energy in plastic scintillator 52, which is used to initiate a timing measurement. Each of these signals 65 may be if different amplitude, which makes upper trace, containing many signals, look blurred. These pulse are much faster than those from the conventional inorganic scintillators used to detect the gamma rays. The output signals 72 from the constant fraction discriminator is shown above the input signal 65. The time scale: 10 nanoseconds/division.

Page 17, first full paragraph:

Figure 8 shows an oscilloscope tracing showing anode signal 65 from the photo-multiplier 63 from plastic scintillator 65, which is used to initiate a timing measurement. This pulse is much faster than that from the conventional inorganic scintillators [[12]] 52 used to detect the gamma rays. The output signal 72 from the constant fraction discriminator is shown above. The time scale in this image is 10 nanoseconds/division. The measurement depicted in Figure 8 was made with an oscilloscope whose bandwidth was only 150 MHz, so the rise time of the display is actually limited by the oscilloscope's rise time.